REMARKS

After entry of this Amendment, claims 1, 2 and 4-16 will be all the claims pending in the application. Claim 11 has been amended to depend from claim 10 to correct an improper antecedent basis.

No new matter has been added.

Entry of the above amendments is respectfully requested.

I. Preliminary Matters

Applicants thank the Examiner for withdrawing the rejection of claims 1, 2, 4-8 and 12-16 under 35 U.S.C. §§ 102(b)/103(a) over Hashiguchi et al. (U.S. Patent Publication 2002/0180088), and the rejection of claims 9-11 under 35 U.S.C. § 103(a) over Hashiguchi et al. in view of Noguchi et al. (U.S. Patent Publication 2003/0191228) in view of Applicants' Amendment filed September 23, 2008.

II. Claim Rejections - 35 U.S.C. § 102/103

(A) On page 3 of the Office Action, claims 1, 2, 4, 5, 7, 8, 10 and 12-16 are rejected under 35 U.S.C. § 102(e) as allegedly anticipated by, or in the alterative, allegedly unpatentable over Mehler et al. (U.S. Patent Publication 2004/0058214). Applicants traverse the rejection for the following reasons.

(1) The Present Invention

Initially, Applicants submit that the present invention provides an electroconductive resin composition having a low contact resistance and penetration resistance; a

molded product produced therefrom; and a fuel cell separator obtained by molding the composition. *See*, page 5, lines 24-33 of the specification. The present invention is characterized by controlling the dispersion of the electroconductive material in the continuous phase (sea) by using a multi-component polymer-type resin binder having a micro-phase separation (island-in-sea) structure and controlling the size of the dispersed phase (island). *See*, page 5, line 34 to page 6, line 1; page 9, lines 6-9; and page 11, line 21 to page 12, line 2.

The multi-component polymer-type resin binder, Component (A) of the present invention, having a micro-phase separation (island-in-sea) structure is typically obtained by a blend of two or more kinds of polymers, preferably a blend produced by a fusion method, or obtained from a copolymer produced by copolymerizing two or more kinds of polymer chains.

The present invention has a feature that the number-average particle size of the dispersed phase in the multi-component polymer-type resin binder is smaller than the number-average particle size or number-average fiber diameter of the electroconductive material, whereby the electroconductive material is inevitably present in the continuous phase of the multi-component polymer-type resin binder, which results in high loadings of the electroconductive material in the continuous phase.

(2) The Cited Document

On the other hand, Mehler et al. relate to a bipolar plate for PEM (polymer electrolyte membrane) fuel cells made of a polymer blend which is filled with conductivity-enhancing carbon fillers (the bipolar plate corresponds to a separator). The polymer blend includes at least two mutually non-miscible blend polymers. The at least two blend polymers form a co-continuous structure. The carbon fillers are at a higher concentration in one of the blend polymers or in the phase between the blend polymers, or a blend polymer in which the

carbon fillers are at a higher concentration forms a continuously conductive matrix in which the at least one further blend polymer is intercalated. *See*, paragraph 0033.

(3) Mehler does not specifically anticipate claims 1, 2, 4, 5, 7, 8, 10, and 12-16

Applicants respectfully submit that Mehler et al. does not specifically anticipate each of the claimed limitations. The Office Action does not provide a basis where or how Mehler et al. reads on the limitations of claim 1 (i.e., wherein the number-average particle size of the dispersed phase in the multi-component polymer-type resin binder is smaller than the number-average particle size or number-average fiber diameter of the electroconductive material; or wherein the multi-component polymer-type resin binder has a micro-phase separation structure comprising a resin component constituting the dispersed phase and a resin component constituting the continuous phase). Additionally, the Office Action does not provide a basis where or how Mehler et al. specifically reads on the limitations of claims 2, 8 and 10; Applicants submit that Mehler et al. does not teach the mass% of component (A) and (B); that component (B) comprises at least one of metallic materials, carbonaceous materials, electroconductive polymers, fillers coated with a metallic material, or metallic oxides; or that the component (B) comprises .1-50 mass% of vapor-phase grown carbon filer and/or carbon nanotube. Applicants submit that Mehler et al. does not specifically anticipate claims 1, 2, 8 and 10, and that claims 4, 5, 7, and 12-16 are at least patentable over Mehler et al. by virtue of their dependency from claim 1.

(4) Mehler does not inherently anticipate claims 1, 2, 4, 5, 7, 8, 10, and 12-16

Further, Applicants respectfully submit that Mehler et al. does not inherently anticipate each of the claimed limitations. The Office Action does not provide a basis in fact and/or technical reasoning to reasonably support the assertion that the alleged inherent characteristics of claim 1 (i.e., an electroconductive resin composition, wherein the number-average particle size of the dispersed phase in the component (A) is smaller than the number-average particle size or number-average fiber diameter of the component (B), and wherein the multi-component polymer-type resin binder (A) has a micro-phase separation structure comprising a resin component constituting the dispersed phase and a resin component constituting the continuous phase) necessarily flow from the teachings of Mehler et al.. Additionally, the Office Action does not provide any basis in fact and/or technical reasoning to reasonably support the assertion that the allegedly inherent characteristics of claims 2, 8 and 10 (i.e., that the multi-component polymer-type resin binder constitutes 40-2 mass% and the electroconductive material constitutes 60-98 mass%; that the electroconductive material comprises at least one of metallic materials, carbonaceous materials, electroconductive polymers, fillers coated with a metallic material, or metallic oxides; and that the electroconductive material comprises 0.1-50 mass% of vapor-phase grown carbon fiber and/or carbon nanotube) necessarily flow from the teachings of Mehler et al. Applicants submit that Mehler et al. does not inherently anticipate claims 1, 2, 8 and 10, and that claims 4, 5, 7, and 12-16 are at least patentable over Mehler et al. by virtue of their dependency from claim 1.

(5) Mehler et al. do not disclose or suggest the present invention

Applicants submit additional reasons why the limitations of claim 1 are not necessarily present in the bipolar plate for PEM fuel cells of Mehler et al.

It is stated in the Office Action that "Mehler also teaches the non-miscible polymer blend may have particles of one blend polymer being dispersed in the other blend polymer as a continuous phase… [0034]." However, Applicants submit that Mehler at al. state, at paragraph [0034], that "[t]he expression "co-continuous structure" relates to a structure in which both blend polymers form a continuous phase, rather than, for example, particles of one blend polymer being present in dispersed form in the other blend polymer as a continuous phase." This means that each of the at least two blend polymers forms a continuous structure, and that none of the at least two blend polymers forms particles of one blend polymer being present in dispersed form in the other blend polymer as a continuous phase. Therefore, the polymer blend of Mehler et al. is different from the "multi-component polymer-type resin binder (A) comprising a dispersed phase and a continuous phase" of the present invention.

In the Examples 1, 3 and 4 of Mehler et al., the polymer blend was prepared by mixing polyamide 6.6 with polyether sulfone. The content of polyether sulfone is greater than that of polyamide 6.6. Mehler et al. state, at paragraph [0073], that the conductive carbon fillers were present very predominantly in the polyamide phase, which is a minor component of the polymer blend.

On the other hand, in the present invention, the electroconductive material is inevitably present in the phase of the major component constituting the multi-component polymer-type resin binder, i.e. the continuous phase or sea phase, because the number-average particle size or number-average fiber diameter of the electroconductive material is larger than the

number-average particle size of the dispersed phase (island phase) of the minor component constituting the multi-component polymer-type resin binder.

The solution of Mehler et al. is to provide high electroconductivity using a small amount of conductive carbon fillers by filling conductive carbon fillers predominantly in the minor component of the polymer blend. On the other hand, the solution of the present invention is to fill a large amount of electroconductive material in the major component constituting the multi-component polymer-type resin binder by controlling the dispersion state of the electroconductive material.

Therefore, claim 1 of the present invention is not anticipated by or obvious over Mehler et al. because Mehler et al. does not teach or suggest that the number-average particle size of the dispersed phase in the multi-component polymer-type resin binder is smaller than the number-average particle size or number-average fiber diameter of the electroconductive material, which is one of the limitations of claim 1 of the present invention.

Applicants thereafter submit that claims 2, 4, 5, 7, 8, 10, and 12-16 are at least patentable over Mehler et al. by virtue of their dependency from claim 1.

Withdrawal of the rejection is respectfully requested.

(B) On page 5 of the Office Action, claims 1, 4-8, and 12-16 are rejected under 35 U.S.C. § 102(e) as allegedly anticipated by, or in the alternative, allegedly unpatentable over Thielen et al. (U.S. Patent 6,331,586). [1] Applicants traverse the rejection for the following reasons.

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[1] Applicants note that Thielen et al. is also a reference under § 102(b).

First, Applicants submit that Thielen et al. relate to a polymer blend comprising (a) at least two polymers which are at least partially immiscible with each other and are present in proportions such that each polymer forms a respective continuous phase and the two respective continuous polymer phases are co-continuous with each other in the polymer blend, and (b) at least one conductive material in particulate or fiber form which is localized in one of said co-continuous polymer phases or localized at a continuous interface between said co-continuous polymer phases. Applicants submit that the aim of Thielen et al. is to reduce the conductive material loading necessary for imparting conductivity to a polymer.

Due to the above-mentioned aim, the amount of the conductive material contained in the polymer blend is in the order of several percent, i.e. very small, as can be seen from the Examples of Thielen at al.

Therefore, the solution of Thielen et al. is basically the same as that of Mehler et al. (i.e., to provide high electroconductivity using a small amount of conductive carbon fillers by filling conductive carbon fillers predominantly in the minor component of the polymer blend). On the other hand, the solution of the present invention is to fill a large amount of electroconductive material in the major component constituting the multi-component polymer-type resin binder by controlling the dispersion state of the electroconductive material. Therefore, the present invention differs from Thielen et al.

Next, Applicants submit that the Office Action states that "[a]t Fig. 3 and Col. 7 lines 19-34, Thielen teaches the (a) conductive co-continuous polymer blend having an island in the sea morphology." Applicants submit that Figure 3 of Thielen et al. shows that a number of carbon black particles are present in island phases or dispersed phases; in other words, the particle size of the conductive material is smaller than the size of the dispersed phase. Therefore, the relation

between the size of the electroconductive material and the size of the dispersed phase is opposite to that of the present invention. Accordingly, Thielen et al. do not disclose that the number-average particle size of the dispersed phase in the multi-component polymer-type resin binder is smaller than the number-average particle size or number-average fiber diameter of the electroconductive material.

Therefore, claim 1 of the present invention is not anticipated by or obvious over Thielen et al. because Thielen et al. does not teach or suggest that the number-average particle size of the dispersed phase in the multi-component polymer-type resin binder is smaller than the number-average particle size or number-average fiber diameter of the electroconductive material, which is one of the limitations of claim 1 of the present invention.

Applicants thereafter submit that claims 4-8 and 12-16 are at least patentable over Thielen et al. by virtue of their dependency from claim 1.

Withdrawal of the rejection is respectfully requested.

III. Claim Rejections - 35 U.S.C. § 103

On page 7 of the Office Action, claims 6, 9 and 11 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Mehler et al. as applied to the above, and further in view of Noguchi et al.

Applicants submit that Noguchi et al. do not teach or suggest the micro-phase separation (island-in-sea) structure of the present invention, and thus, do not make up for deficiencies of Mehler et al. with regard to claim 1 as discussed above, and therefore a *prima facie* case of obviousness has not been made because the combination of Mehler et al. and Noguchi et al. does not teach or suggest each and every element of the present invention.

Applicants submit that claims 6, 9 and 11 are at least patentable over the combination of Mehler et al. and Noguchi et al. by virtue of their dependency from claim 1.

Withdrawal of the rejection is respectfully requested.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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Date: February 9, 2009